Near Detector Site Preparation

WBS 2.8.1

(Overview and Excavation Plan)

June 5, 2007

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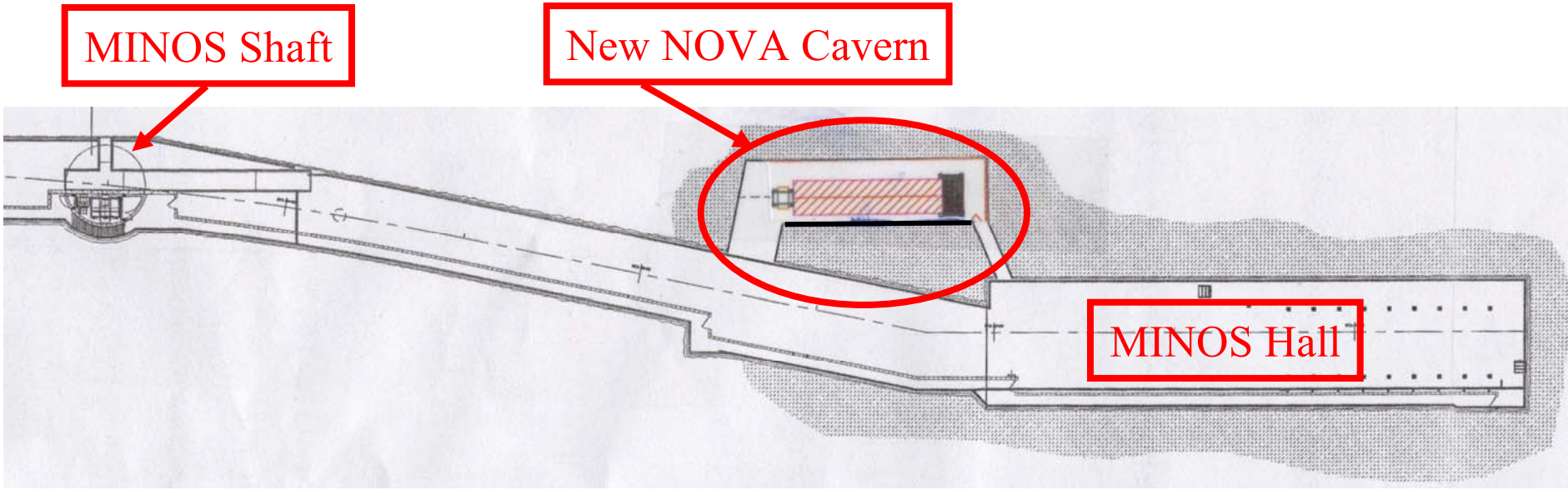
WBS 2.8.1
Near Detector Site Preparation

- Excavate/outfit a cavern for the NOVA Near Detector
  - Design and Engineer Cavern excavation
  - Design and Engineer Cavern/tunnel infrastructure
  - Tunnel/Cavern Infrastructure Contract
  - Cavern Excavation Contract
  - Connect and Certify FIRUS
  - Specify safety and training requirements
  - Beneficial Occupancy of New Cavern
  - Survey location for Detector

Red Bullets – Primarily this presentation
Blue Bullets – Some discussion this presentation; most next presentation
Black Bullets – Next Presentation

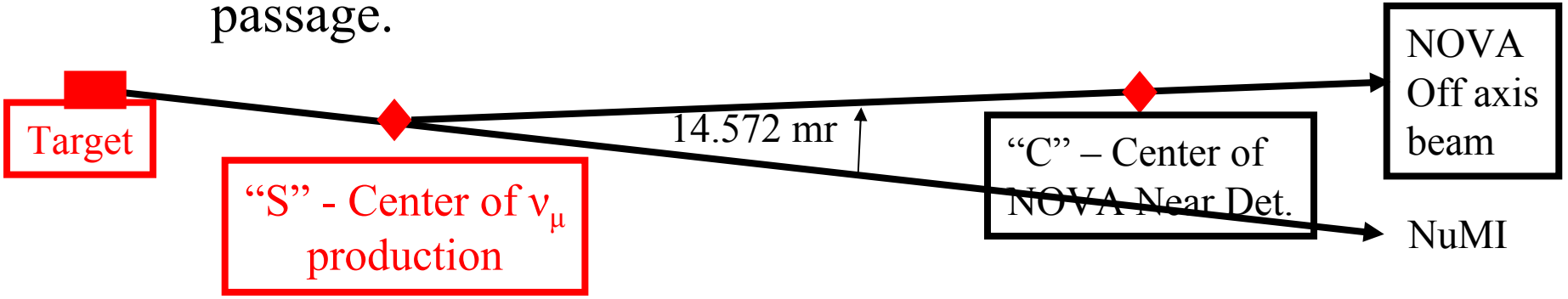
WBS 2.8.1.1
Design and Engineer Cavern Excavation

- Design and Engineer Cavern excavation
  - Fix Location of Cavern
  - Fix Size of Cavern
  - Design and Engineer Cavern with Tunneling A&E
  - Review and Certify Design



WBS 2.8.1.1.1
Fix Location of Cavern

- Locate center of Near Detector at the same angle from the NuMI Beamline axis as the Far Detector.
  - Angle measured from the calculated center of muon neutrino production – 184.45 m downstream from "target" on NuMI beamline (inside decay pipe)
  - Far detector at 14.572 mr.
  - Set center of Near Scintillator at same angle 32 foot upstream of entrance to MINOS Hall and 7 foot above floor, west of NuMI beamline.
  - New cavern location does not block access to MINOS Hall.
  - Leave adequate rock between new cavern and access passage.



WBS 2.8.1.1.2
Fix Size of Cavern

- The installation group will need to determine if it is acceptable to have the detector access limited to the west side.
- The installation group will need to determine if there is sufficient space above the detector for access.
- The installation group will need to verify the size of the opening into the cavern from the MINOS access passage for transporting the detector subassemblies.
- Upstream and downstream clearances will need to be checked.
- Clearance for HVAC ducts, lights, fire suppression, etc. will need to be checked.

WBS 2.8.1.1.3
Design/Engineer Cavern with A&E

- The rock excavation and support system must be designed by a competent engineer.
- The shale rock was rather uniform and the NuMI/MINOS excavation experience is probably relevant.
- The shale will have to be covered with shotcrete to prevent moisture from weakening the rock surfaces.
- The invert could be taken down to the top of the Galena Platteville structure.

WBS 2.8.1.1.4
Review and Certify Design

- The proposed excavation and design should be reviewed by an independent competent geologist/engineer.
- Life safety issues for the final design as well as during construction should be reviewed by an appropriate specialist.
- This includes ventilation issues.
- Minimizing the impact on other facilities in the MINOS Hall should be reviewed. (MINOS, Minerva, Coupp etc.)

WBS 2.8.1.2

Design/Engineer Cavern/tunnel infrastructure

- The design must reflect adequate space for lighting, fire suppression, ventilation, and any other required utilities.
- Provision for additional cooling of process water, if necessary, must be made.
- If the oil containment requires that there be no perimeter floor drains in the new cavern, then provision for removal of any infiltrating water must be made.
- A decision on including a drip roof must be made.
- Relocation of existing utilities blocking the future cavern access way and emergency exits must be designed.

WBS 2.8.1.3
Tunnel/Cavern Infrastructure Contract

- The relocation of the existing utilities must be done prior to the start of the excavation contract.
- The relocation of utilities will impact (require turning off) existing facilities in the MINOS Hall. The work must be scheduled during accelerator down times if possible.

WBS 2.8.1.4
Cavern Excavation Contract

- The excavation contract should be planned so that the impact on operating facilities is minimized.
- If existing facilities operations could be maintained, that would be beneficial.
- The elapsed time for the excavation should be minimized to keep costs and other impacts down.
- Investigation of the possible use of a road-header rather than drill and blast techniques could be promising.
- DOE Safety expectations must be included in all aspects of the contract and execution of the work.

WBS 2.8.1.6

Specify safety and training requirements

- DOE safety expectations must be emphasized in the contract and during execution of the work.
- If other facilities remain in operation during the excavation, then additional training of staff entering the MINOS shaft, access area, and MINOS Hall must be provided.

WBS 2.8.1.7

Beneficial Occupancy of New Cavern

- Provision for a smooth transition to the outfitting contractor following the excavation work must be included.

WBS 2.8.1.7
Cost and Schedule Estimates

- The basis of estimate for this work included experience from excavation of the MINOS Cavern at Soudan and the NuMI/MINOS excavation at Fermilab.
- An estimate of the workforce and methodology was also made.
- The basis of estimate information is available to the reviewers.
- Supplemental Information: See NOVA Doc 1922.